

MEGATHYMUS YUCCAE IN TEXAS,
WITH THE DESCRIPTION OF TWO NEW SUBSPECIES

by H. A. FREEMAN

After many hours of thought and discussion DON B. STALLINGS and I have reached the following conclusions concerning the arrangement of the various subspecies of *Megathymus yuccae* (Bdv. & Lec.) in the state of Texas. We have been working with this group for nearly twenty years, and there was a time when we had a few specimens of *yuccae* from isolated locations over the state and these clearly told us the complete story of *yuccae* in this area. Now that we have nearly five thousand specimens of Megathymidae in our separate collections the clarity of the picture dims. Since receiving a research grant from the National Science Foundation I have been making every effort to approach this problem from a strictly scientific viewpoint. There are so many factors that seem to have brought about the production of subspeciation in this group that I have been trying to associate these factors together so as to arrive at some definite conclusions. In the various habitats that I have been studying over the state such things as plant associates, type of soil, pH of soil, elevation, average rainfall, and whether or not there is any indication of radiation present, have been checked and recorded. These factors certainly seem to have had some influence upon the particular subspecies found in any given area. Genetically speaking there appear to be two major influences affecting the Texas populations, from *coloradensis* to the west and from *yuccae* to the east, while from the south comes a minor influence of *wilsonorum*. Environmental factors may have influenced the production of minor mutations that have survived and these increased through the years due to isolation of various stands of *Yucca*, thus building up factors that would produce eventual subspecies. I have no doubt that we are seeing seconds unfold in the millennium required to change these subspecies into species.

Whether we are dealing with a single superspecies or a number of sibling species is a question that cannot be definitely decided at the present; however, to me, it appears that *coloradensis* Riley and *yuccae* have progressed to the point in evolution where they actually constitute two separate species. Being unable to prove this at the present I will consider them to be conspecific in dealing with the classification of the *yuccae* group in Texas. The map shows the general distribution of the various subspecies of *yuccae* in Texas.



THE RANGE OF THE VARIOUS SUBSPECIES OF *Megathymus yuccae* IN TEXAS

1. *Megathymus yuccae reinthali* Freeman
2. *Megathymus yuccae coloradensis* Riley
3. *Megathymus yuccae stallingsi* Freeman
4. *Megathymus yuccae louiseae* Freeman
5. *Megathymus yuccae wilsonorum* Stallings & Turner
6. A new subspecies being described by STALLINGS and TURNER
7. A "flux" area where the specimens seem to show characteristics of more than one subspecies.

In the eastern part of Texas, extending from just southwest of Texarkana over to Mt. Pleasant, down to Canton and Buffalo and over to all the Ben Wheeler, Crow and Tyler area there are found individuals that seem to represent the western extension of *yuccae yuccae*; however they seem to indicate a blending together of some of the characteristics of *yuccae yuccae coloradensis*, especially the specimens from two miles west of Ben Wheeler. Since these specimens seem to have characteristics more or less their own, I am naming this population as follows.

MEGATHYMUS YUCCAE REINTHALI Freeman, NEW SUBSPECIES

FEMALE. Upper surface of primaries: shiny black, with a heavy orange-yellow overscaling at the base of the wings. There is a narrow white overscaled area along the outer margin near the apex. Spot 1 (cell spot) is broadly rectangular, with the lower inner side elongating out into a point directed towards the base of the wings and being orange-yellow in color. Spots 2, 3, and 4 are white and broadly rectangular. Spots 5 and 6 are prominent and squarish in shape, being deep yellow in color. Spots 7 and 8 are broadly rectangular (4-5mm. wide) and are deep orange-yellow in color. Spot 9 is broadly triangular with the inner edge usually a little wider than the two spots above and it is of the same color. Spot 7 is situated slightly under the inner edge of spot 6. There is a faint orange spot located two-thirds of the way in towards the base from spot 9. Fringes are checkered gray and black. Under surface of primaries: dull black, with the outer margin overscaled with white. All spots reappear and are of about the same color as above.

Upper surface of secondaries: shiny black, with some orange-yellow hairs and scales near the base. There is a dark yellow marginal border varying from 2-3mm. wide. Spots 10 and 11 are fused together into a large orange-yellow spot. Spots 12 and 13 are square, averaging 2mm. across and are orange-yellow. There is usually a rather prominent phantom spot in space 14 of above the same color as the other spots. The fringes are dark yellow. Under surface of secondaries: dull black over the basal and discal areas. The outer portion of the costal area overscaled with grayish-white scales and there is a slight overscaling of gray along the outer margin. There are two white subcostal spots and some specimens may have one or two white spots below these nearer the center of the wing.

Abdomen black above, gray beneath. Thorax black above lighter beneath. Palpi clear white. Antennae have the club black with some white beneath; the remaining portion is black ringed with white above and nearly all white beneath.

Length of forewing varies from 31 to 37 mm., average 34 mm. Wing measurements of Holotype: forewing, apex to base 34 mm., apex to outer angle 20 mm., outer angle to base 25 mm.; hindwing, base to end of vein Cu_1 24 mm.

MALE. Upper surface of primaries: shiny black, with a heavy overscaling of orange-yellow hairs and scales at the base. There is a slight, narrow grayish overscaling near the apex. The orange-yellow cell spot (spot 1) is fairly large and there are three small linear white spots above it. Spots 2, 3 and 4 are white and fairly broad. Spots 5 and 6 connect by a narrow line to the subapical spots and are light yellow in color. Spots 7 and 8 are fairly broad, extending about halfway under spot 6 and are orange-yellow in coloration. Spot 9 is slightly pointed inward toward the base of the wing and is of the same color as 7 and 8. The fringes are gray and black. Under surface of primaries: dull to shiny black, with the overscaling of gray near the apex much more extensive than above. The spots all reappear and are slightly lighter in coloration.

Upper surface of secondaries: shiny black, with some orange-yellow hairs and scales near the base. There is an orange-yellow marginal border 2 to 2.5mm. wide. Some specimens show one or two discal spots of the same color as the border, however most do not have this. Fringes dark yellow. Under surface of secondaries: similar to the female, except there is often but a single subcostal white spot and the small white spot or spots that sometimes shows up in the female beneath the subcostal spots are absent.

Abdomen gray above, with a few orange-yellow hairs present, dull black beneath. Thorax black above, somewhat lighter beneath. Palpi clear white. Antennal club black, except at the base, above and white beneath; the remainder white, slightly ringed with black above.

Length of the forewing varies from 22 to 29 mm., average 28 mm. Wing measurements of the Allotype: forewing, apex to base 28 mm., apex to outer angle 17 mm., outer angle to base 20 mm.; hindwing, base to end of vein Cu_1 18.5 mm.



Top row: *M. yuccae louiseae* ALLOTYPE ♂, 16 miles n. Del Rio, Texas, 2 May 1960.

2nd row: *M. yuccae louiseae* HOLOTYPE ♀, 16 miles n. Del Rio, Texas, 5 May 1960.

3rd row: *M. yuccae reinthali* ALLOTYPE ♂, two miles w. Ben Wheeler, Texas, 23 Mar. 1961.

Lower row: *M. yuccae reinthali* HOLOTYPE ♀, two miles w. Ben Wheeler, Texas, 28 Mar. 1961.

Described from 89 specimens (52 males and 37 females). 84 of these specimens were collected by the author at the following locations in Texas: 2 miles west of Ben Wheeler (Van Zandt Co.) Texas, el.410 feet, pH 5 (type locality), 10 ♂♂, 8 ♀♀ from *Yucca louisianensis* which emerged March & April 1956-58-60-61; 8.8 miles s. Canton (Van Zandt Co.), el.500 feet, pH 5, from *Y. louisianensis*, 2 ♂♂, 1 ♀, March 1958, and 100 yards from this area in *Yucca freemanii*, pH 4.9, 6 ♂♂, 4 ♀♀, March 1952-53-54-56-58; 3.5 miles n.e. Crow (Wood Co.), el.500 feet, pH 5, in *Y. louisianensis*, 7 ♂♂, 3 ♀♀, March & April, 1950 & 1958; 1 mile n. Crow, el.490 feet, pH 5, in *Y. louisianensis*, 1♂, 2 ♀♀, April 1958; 2 miles n.w. Buffalo (Leon Co.), el.390 feet, pH.5, in *Y. louisianensis*, 2 ♂♂, 2 ♀♀, March & April 1951-56-57: Tyler State Park (Smith Co.), el.360 feet, pH 5, in *Y. louisianensis*, 20 ♂♂, 16 ♀♀, March & April 1950-51-52-53-58-59-60-61. Four specimens were collected as larvae in *Y. louisianensis* by STALLINGS and TURNER at Oakwood (Leon Co.), Texas (emerged during March 1952), and Tyler, Texas (same date); 1 ♀ Luling, Texas, 24 March 1952.

HOLOTYPE female, two miles w. Ben Wheeler, Texas, 28 March 1961, reared in *Yucca louisianensis*; ALLOTYPE male, same location and food plant, 23 March 1961; both were collected by the author and are in his collection. Two pairs of Paratypes will be placed in the Stallings and Turner collection and one pair each will be placed in the American Museum of Natural History and the collection at Yale University. The rest of the Paratypes are in the collection of the author.

I take pleasure in naming this new subspecies for my good friend Dr. W. J. REINTHAL who did some work on this butterfly while he was living in Texas.

This is the subspecies which is found in or near woods, especially where pines and oaks occur. All specimens were located in areas where the pH was 5 or slightly below, indicating an acid relationship. All the other subspecies of *yuccae* occur in nearly neutral or alkaline soil in the state. This is a sandy soil subspecies.

In comparing this subspecies with typical *yuccae* from Georgia, the ground color is more of a shiny black color in *reintali*; even though the wing shape is broad it is not as broad as typical *yuccae*; the maculation is somewhat different; and even though the color of the spots, overscaling near base of wings and marginal border of secondaries is dark yellow it is still not as dark as some of the specimens of typical *yuccae*. For a comparison with the other subspecies refer to the keys.

Megathymus yuccae coloradensis Riley

This very extensive subspecies or species covers a rather wide area north and west of Texas and only enters the state as typical *coloradensis* in the Panhandle area. I collected two specimens on the wing in the Palo Duro Canyon that appear to be very much like specimens collected around Colorado Springs, Colorado (type locality). The apparent food plant of *coloradensis* in the Palo Duro Canyon is *Yucca glauca*, as that was the only species of *Yucca* that I observed in the area. The soil is rocky and shows red clay and some limestone outcropping in various regions of the canyon. The pH was 6.8, indicating nearly neutral soil.

There is a wide area extending into Texas from New Mexico which passes through San Angelo and extends through Stephenville, Glen Rose, Walnut Springs, Waxahachie over to near Ben Wheeler where the specimens appear to have received a decided *coloradensis* influence at sometime during the past. This is characterized by wing shape and pattern of maculation. Genitalic tendencies are towards that apparent supersubspecies. In this particular group the genitalia seem to fall into definite regional patterns with considerable amounts of variation present within each region, indicating that a considerable amount of evolution is in progress there. In this broad strip the specimens feed on the following species of *Yucca*: *rupicola*, *pallida*, *louisianensis*, and a hybrid of *arkansana* × *pallida*.

Megathymus yuccae stallingsi Freeman

This subspecies covers a restricted part of Texas, as indicated on the distributional map. It is associated with limestone soil in most areas that has a pH of 7.2 to 7.8, indicating an alkaline relationship. The most popular food plant is *Yucca arkansana*, however in certain areas it feeds upon *Yucca pallida*, especially around Cedar Hill (south-western Dallas Co.) which just about constitutes its southern limit. This subspecies is more or less common in the region indicated and often will be found in urban areas as well as in the open country, especially if it was originally prairie country. In the Dallas area there were several large colonies present ten years ago, one on Buckner Boulevard near the Drive-in Theater and near Lancaster there were several nice colonies. Extensive building of new homes has just about eliminated all of these habitats. Plants often associated with it are mesquite, cedars, elms and Johnson grass.

Specific differences making it possible to recognize this subspecies can be noted in the keys.

I have been working for some time on the particular group of individuals that have been found from Mertz on southward through Sonora to Del Rio and westward to five miles west of Langtry, Texas, where they apparently stop. This entire area is covered by individuals that seem to have distinctive subspecific characteristics. Extending southeast of Del Rio to Laredo and over into Mexico around Allende, Coahuila, are found specimens that show a decided relationship to this particular subspecies, however I am not including them in the original description of this new subspecies, merely indicating that they possibly should be associated with them since more study of the area is needed.

MEGATHYMUS YUCCAE LOUISEAE Freeman, NEW SUBSPECIES

FEMALE. Upper surface of primaries: flat black, with some faint grayish-yellow overscaling near base of wings. There are a few white scales along the outer margin near the apex. Spot 1 (cell spot) is somewhat square and yellowish-white. The subapical spots (2, 3 and 4) are white, and all the others are yellowish-white, with spots 5 and 6 (submarginal spots) paler than the others. Spot 7 is square on three sides and rounded on the outside. Spot 8 is similarly shaped, however it is slightly smaller in size. Spot 9 is somewhat triangular with the apex sharply pointing toward the base of the wings. Spot 7 is situated just beneath the inner edge of spot 6. All three discal spots show an even gradual curve inward with spot 9 being somewhat nearer the base of the wings than the two above. The fringes are checkered sordid white and black. Under surface of primaries: black, with the entire outer margin overscaled with grayish-white scales. All spots reappear and are of about the same general coloration as above.

Upper surface of secondaries: black, with a few yellowish-gray hairs near the base. The marginal border is medium in width, being sordid white blending into gray. The discal spots are reduced, 10 and 11 are mere dots, whereas 12 and 13 are better defined and somewhat rounded on their outer surfaces. Sometimes a phantom spot shows up in space 14. The fringes are sordid white. Under surface of secondaries: Grayish-black, rather heavily overscaled with grayish scales, especially along the margin and near the costa. There is a well defined white subcostal spot and about half of the specimens have a minute, linear spot outside of this one.

Abdomen grayish-black above, gray beneath. Thorax grayish-black above, lighter beneath. Palpi are sordid white. Antennal club black with some white beneath, the remaining portion is black ringed with white above and nearly all white beneath.

Length of forewing varies from 30 to 35 mm., average 33 mm. Wing measurements of Holotype: forewing, apex to base 34 mm., apex to outer angle 20 mm., outer angle to base 22 mm.; hindwing, base to end of vein Cu_1 22.5 mm.

MALE. Upper surface of primaries: flat black, with a faint, light gray overscaling at the base. There is a narrow overscaling of white scales near the apex. Cell spot (spot 1) is small and somewhat oval. Spots 2, 3, and 4 are white and well defined. Spots 5 and 6 are white and fairly well defined. Spots 7, 8 and 9 are shaped somewhat like those in the female only smaller and are yellowish-white in color. Spot 7 reaches just to the inner edge of spot 6. The fringes are sordid white and black. Under surface of primaries: black, with the outer margin overscaled with grayish-white scales. All spots reappear and are lighter, being nearly all white.

Upper surface of secondaries: black, with a few grayish hairs near the base. The marginal border is medium in width and is sordid yellowish-white. Fringes are white. Under surface of secondaries: very similar to the female, except the second subcostal spot is a little better defined.

Abdomen, thorax, palpi and antennae are the same as in the female.

Length of forewing varies from 25 to 29 mm., average 27 mm. Wing measurements of the Allotype: forewing, apex to base 27 mm., apex to outer angle 16 mm., outer angle to base 18 mm.; hindwing, base to end of vein Cu_1 16 mm.

Described from 63 specimens (35 males and 28 females) all reared from larvae. Seven specimens were collected by STALLINGS and TURNER, six miles north of Del Rio, Texas, in *Yucca thompsoniana*. These emerged during February and March 1955. The remaining 56 specimens were collected in Texas by the author at the following locations: 5.5 miles w. of Mertzon (Irion Co.), el.2300 feet, pH 7.1, in *Yucca campestris* & *Yucca reverchoni*; 10 miles s. Christoval (Tom Green Co.), el.1850 feet, pH 7, in *Y. reverchoni*; 50.5 miles n. Del Rio (in Edwards Co.), el.2100 feet, pH 7.2, in *Y. reverchoni*; 28 miles n. Del Rio (Val Verde Co.), el.1500 feet, pH 7.1, in *Y. reverchoni* & *thompsoniana*; 16 miles n. Del Rio (type locality), el.1450 feet, pH 7.1, in *Y. reverchoni*, *Y. torreyi*, & *Y. thompsoniana* (host plant of Holotype and Allotype); 6 miles n. Del Rio, el.1050 feet, pH 7.1, in *Y. torreyi*, *Y. reverchoni* & *Y. thompsoniana*; 12 miles s. Juno (Val Verde Co.), el.1450 feet, pH 7.1, in *Y. thompsoniana* and *Y. torreyi*; Comstock (Val Verde Co.), el.1550 feet, pH 7.5, in *Y. thompsoniana*; east side of the Pecos River Canyon (Val Verde Co.), el.1400 feet, pH 7, in *Y. thompsoniana*; and 5 miles w. of Langtry (Val Verde Co.), el.1350 feet, pH 7, in *Y. thompsoniana*. These emerged during February through May of 1960 and 1961.

HOLOTYPE, female, 16 miles north Del Rio, Texas, 5 May 1960, reared in *Yucca thompsoniana*; ALLOTYPE, male, same location and food plant, 2 May 1960; both were collected by the author and are in his collection. Paratypes will be placed in the Stallings and Turner collection, American Museum of Natural History and the collection at Yale University.

I take pleasure in naming this new subspecies for my wife who has helped me greatly in my work on the Megathymidae.

This is the subspecies that is found west and southwest of the Edwards Plateau, in Texas, where the soil is rocky and has a pH of from 7 to 7.5. Some of the plants found in the same area where *louiseae* occurs are scrub cedars, mesquite, sotol, ocatilla, *Mahonia*, cat claw, various cacti, and in some areas *Agave lecheguilla*. The predominant food plant is *Yucca thompsoniana*.

In comparing this subspecies with *M. yuccae wilsonorum*, its nearest relative, the wing shape is slightly different, not being as narrow as in *wilsonorum*; the disposition of spots 7, 8 and 9 are slightly farther out towards the outer margin in *louiseae*; the coloration is somewhat lighter in *louiseae*; and the discal band of spots on the secondaries of the females

are more definite in *louiseae* than in *wilsonorum*. For a comparison with the other subspecies refer to the keys.

Megathymus yuccae wilsonorum Stallings & Turner

This Mexican subspecies, or possibly a sibling species, enters the United States only in a narrow strip extending from Rio Grande City to near Mission, Texas, where it feeds only in plants of *Yucca treculiana*. In the areas that I collected in during December of 1959 and 1960 I found most of my specimens in sandy soil around Sullivan City, el.150 feet, and near Rio Grande City, el.230 feet. The soil that I tested ran from pH 7.3 to 7.5. This subspecies occurs in rather thick brushy country which makes the discovery of tents rather difficult.

I am of the opinion that this subspecies is not closely related to either *M. yuccae yuccae* or *M. yuccae coloradensis* but represents another major subspecies complex. I base my conclusions on wing shape, maculation, and the type of habitat that it favors.

M. yuccae wilsonorum has a decided influence on specimens of *yuccae* from the San Antonio and vicinity as well as the specimens collected around Hondo. This entire area extending from San Antonio to near Stephenville and over to Waxahachie has specimens present that have some characteristics of all the subspecies found in the state except those from the extreme southwestern part of the state, and DON STALLINGS and I agree that this is a flux area where genes from many areas seem to flow together to produce specimens that cannot properly be placed into any given subspecies. This flux area is No. 7 on the distributional map.

STALLINGS and TURNER are working on a new subspecies from the extreme southwestern part of Texas, and I am mentioning it only so as to record its presence by No. 6 on the distributional map.

WING SHAPE COMPARISON OF VARIOUS SUBSPECIES OF *MEGATHYMUS YUCCAE*

	<i>reinthali</i>		<i>stallingsi</i>		<i>wilsonorum</i>		<i>louiseae</i>		<i>coloradensis</i>	
Primaries	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Base to apex	27*	31	27	31	27	33	27	31	27	31
Apex to outer angle	17	19	16	18	14	19	16	18	17	29
Outer angle to base	19	23	19	23	15	22	18	22	19	20
Secondaries										
Base to end of Cu ₁	18	23	16	22	14	22	16	21	18	23
	(broad)		(medium)		(very narrow)		(narrow)		(broad)	

*Measurements in millimeters.

KEY TO THE MALES OF THE SUBSPECIES OF *MEGATHYMUS YUCCAE* IN TEXAS

- la. Ground color dark, shiny black above 2
- lb. Ground color flat black above 3
- lc. Ground color brownish-black above wing shape broad; spots above light yellow; heavy light yellow overscaling at base of primaries; spot 7 extends half-way beneath spot 6; cell spot large; marginal border of secondaries wide and light yellow; one crescentic spot and a curved line beneath costa on lower surface of secondaries; average size 50 mm. *coloradensis*
- 2a. Wing shape broad; spots above dark yellow; heavy dark yellow overscaling at base of primaries; spot 7 reaches inner edge of spot 6; cell spot large; marginal border of secondaries medium in width and dark yellow; usually one subcostal spot on lower surface of secondaries; average size 61 mm. *reinthali*
- 2b. Wing shape medium; spots above lemon yellow; faint lemon yellow overscaling at base of primaries; spot 7 reaches inner edge of spot 6; cell spot large; marginal border of secondaries narrow and lemon yellow; usually two subcostal spots on lower surface of secondaries; average size 55 mm. *stallingsi*
- 3a. Wing shape very narrow; spots above dull lemon yellow; heavy dull lemon yellow overscaling at base of primaries; spot 7 does not reach inner edge of spot 6; cell spot small; marginal border of secondaries wide and dull lemon yellow; usually one subcostal spot on lower surface of secondaries; average size 61 mm. *wilsonorum*
- 3b. Wing shape narrow; spots above sordid yellowish-white; faint light gray overscaling at base of primaries; spot 7 barely reaches inner edge of spot 6; cell spot small; marginal border of secondaries medium and sordid yellowish-white; two subcostal spots on lower surface of secondaries; average size 57 mm. *louiseae*

KEY TO THE FEMALES OF THE SUBSPECIES OF *MEGATHYMUS YUCCAE* IN TEXAS

- la. Ground color dark, shiny black above 2
- lb. Ground color flat black above 3
- lc. Ground color brownish-black above; wing shape broad; spots above light yellow; heavy yellowish overscaling near base of primaries spot 7 reaches nearly to outer edge of spot 6; cell spot rectangular, with lower inner edge pointing towards base of primaries; spots 7, 8 and 9 very broad, all about equal width; fringes of primaries yellow, very faintly checkered with brown scales; discal spots of secondaries large and fused together, usually a pronounced phantom spot in space 14; marginal border of secondaries very broad and yellow; under surface of secondaries mottled light and dark; average size 58 mm. *coloradensis*
- 2a. Wing shape broad; spots above dark yellow; heavy orange-yellow overscaling at base of primaries; spot 7 reaches well under spot 6; cell spot large, rectangular with lower inner edge pointing towards the base of the wings; spots 7, 8 and 9 broad, of about equal width; fringes of primaries checkered dark and deep yellow; discal spots of secondaries well developed, 10 and 11 fused together, other there is a phantom spot in space 14; marginal border of secondaries medium in width, dark yellow; under surface of secondaries brownish-black over discal area, gray around costa and margin; average size 69 mm. *reinthali*

- 2b. Wing shape medium; spots above lemon yellow; faint grayish-brown overscaling near base of primaries; spot 7 reaches under inner edge of spot 6; cell spot medium in size, irregularly square; spots 7 and 8 fairly broad, with spot 9 broadly triangular, with the apex pointing inward; fringes of primaries black, faintly checkered with gray scales; discal spots of secondaries well developed, 10 and 11 usually fused; marginal border of secondaries narrow, yellowish gray; under surface of secondaries even brownish-black, with gray around margin; average size 65 mm. *stallingsi*
- 3a. Wing shape very narrow; spots above yellowish-white; fairly heavy grayish-yellow overscaling near base of primaries; spot 7 does not reach inner edge of spot 6; cell spot medium, somewhat square; spots 7 and 8 narrow, above equal size, spot 9 triangular with apex pointing inward; fringes of primaries distinctly checkered dark gray and sordid white; discal spots of secondaries greatly reduced, 10 and 11 usually absent; marginal border of secondaries broad, light yellow; under surface of secondaries grayish-black, darker over the discal area and lighter around the costa and margin; average size 74 mm. *wilsonorum*
- 3b. Wing shape narrow; spots above yellowish-white; faint grayish-yellow overscaling near base of primaries; spot 7 reaches to inner edge of spot 6; cell spot medium, somewhat square; spots 7 and 8 fairly narrow and of about equal size, spot 9 broadly triangular with the apex pointing inward; primaries have the fringes distinctly checkered black and sordid white; discal spots of secondaries reduced, 10 and 11 mere dots, sometimes a phantom spot appears in space 14; marginal border of secondaries medium in width, sordid white blending into gray; under surface of secondaries even grayish-black, with some lighter gray around margin and near the costa; average size 69 mm. *louiseae*

1605 Lewis Drive, Garland, Texas, U. S. A.

TYPOGRAPHICAL ERROR IN McDUNNOUGH BIOGRAPHY

Due to a printer's error in a final stage of preparing volume 16: no.4 of the *Journal* for printing, a false line was substituted in place of the right one and a nonsense sentence resulted in D. C. FERGUSON's biographical obituary of J. H. McDUNNOUGH. The first sentence of the second new paragraph on page 217 should read:

"Dr. McDUNNOUGH was an Honorary Life Member of the Lepidopterists' Society and a cordial and helpful friend to the early moves towards its formal establishment."

Our apologies to Mr. FERGUSON.

C. L. REMINGTON